DIALOGO
DI
GALILEO GALILEI LINCEO
MATEMATICO SOPRAORDINARIO
DELLO STVDIO DI PISA.
E Filosofo, e Matematico primario del
SERENISSIMO
GR. DVCA DI TOSCANA.

Doue ne i congressi di quattro giornate si discorre sopra i due

MASSIMI SISTEMI DEL MONDO
TOLEMAICO, E COPERNICANO:

Proponendo indeterminatamente le ragioni Filosofiche, e Naturali tanto per l'vna, quanto per l'altra parte.

CON PRI  VILEGI.

IN FIORENZA, Per Gio: Batista Landini MDCXXXII.

CON LICENZA DE' SVPERIORI.

Rocky Kolb-GnatSigh Productions Presents

The Dialogue Concerning the Two Chief World Systems

April 14, 2005

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Sagredo: Talia Gorodess
Simplicio: Jeff Eisenberg

I Fantasmi: Alberto Vallinotto
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UNRATED!!!!!!
contains cosmologically explicit material

The following is adapted from the Stillman Drake translation of Galileo's *Dialogue.*

Dialogue Concerning the Two Chief World Systems

Ptolemaic and Copernican, *GALILEO 1630*

(From the Third Day)

Cast of characters: **Salviati: voice of Galileo**

Simplicio: voice of Peripatetics

Sagredo: "impartial" observer

SALVIATI: ***Nella quale segue la considerazione del movimento annuo comunemente attribuito al Sole…*** Let us now consider the apparent movement of the sun, attributed by most people to the sun itself, but then, first by Aristarchus, and later by Copernicus, removed from the sun and transferred to Earth. Sagredo, with his quick wit, shall interpose his thoughts as the spirit moves him.

SAGREDO: ***Lo farò con la mia solita libertà…*** I shall do so with my customary lack of tact; and since you have asked for it, you will be obliged to pardon it.

SALVIATI: ***Ma cominci or mai il signor Simplicio a promuover quelle difficultà...*** Now let Simplicio begin to set forth those objections that prevent him from believing that Earth, like the other planets, may revolve about the sun.

SIMPLICIO: ***La prima e massima difficultà è la repugnanza ed incompatibilità che è tra l'esser nel centro e l'esserne lontano…*** The first and greatest difficulty is the incompatibility between Earth being at the center, while at the same time being distant from the center. But Earth **is** at the center, as is proved in many ways by Aristotle, Ptolemy, and others.

SALVIATI: ***Molto bene discorrete.*** Very well argued. There can be no doubt that anyone who wants to have Earth move along the circumference of a circle must first prove that it is not at the

center of that circle. The next thing is for us to see whether Earth is or is not at that center. Tell me what and where this center is that you mean.

SIMPLICIO: ***Intendo per centro quello dell'universo… I*** I mean by "center," that of the universe; that of the stellar sphere; that of the heavens.

SALVIATI: ***Ancorché molto ragionevolmente io potessi mettervi in controversia…*** I might very reasonably dispute whether there is in nature such a center, seeing that neither you nor anyone else has so far proved whether the universe is finite and has a shape, or whether it is infinite and unbounded.

SIMPLICIO: ***Che il mondo sia finito e terminato e sferico, lo prova Aristotile con cento dimostrazioni.*** Aristotle gives a hundred proofs that the universe is finite, bounded, and spherical.

SALVIATI: ***Che il mondo sia finito e terminato e sferico...*** Which are all reduced to one, and that one to none at all. For if I deny Aristotle his assumption that the universe is movable all his proofs fall to the ground. But I shall concede to you for the time being that the universe is finite, spherical, and has a center. Now tell me, Simplicio: if Aristotle had found himself forced by the most palpable experiences to rearrange his order and disposition of the universe, what do you think he would do?

SIMPLICIO: ***Credo che quando il caso accadesse, i Peripatetici…*** I think that if that should happen, the followers of Aristotle. . . .

SALVIATI: ***Non domando de i Peripatetic…,*** I am not asking about Aristotle's damn followers; I am asking about Aristotle himself. As for the followers, I know very well what they would do. They, as most reverent and most humble slaves of Aristotle, would deny all the experiences and observations in the world, and would even refuse to look at them, and they would say that the universe must be as Aristotle has written, not as observed in nature. I want to know what Aristotle himself would do.

SIMPLICIO: ***Veramente non mi saprei risolvere, qual de' due inconvenienti e' fusse per reputar minore.*** Really, I cannot make up my mind how he would face the difficulty.

SALVIATI: ***Non usate, di grazia, questo termine di chiamar inconveniente quel che potrebb'esser necessario che fusse cosí.*** Please, do not apply this term ``difficulty'' to something that may be so. Let us assume out of respect for Aristotle that the universe is spherical, and like anything that is spherical in shape and moves circularly, has a center.

SIMPLICIO: ***Ma da che argumentate voi che non la Terra, ma il Sole, sia nel centro delle conversioni de' pianeti?*** But how do you deduce that it is not Earth, but the sun, which is at the center of the revolutions of the planets?

SALVIATI: ***Concludesi da evidentissime, e perciò necessariamente concludenti.*** This is deduced from most obvious and therefore most powerfully convincing observations. The most palpable of these, which excludes Earth from the center and places the sun there, is that we find all the planets closer to Earth at one time and farther from it at another.

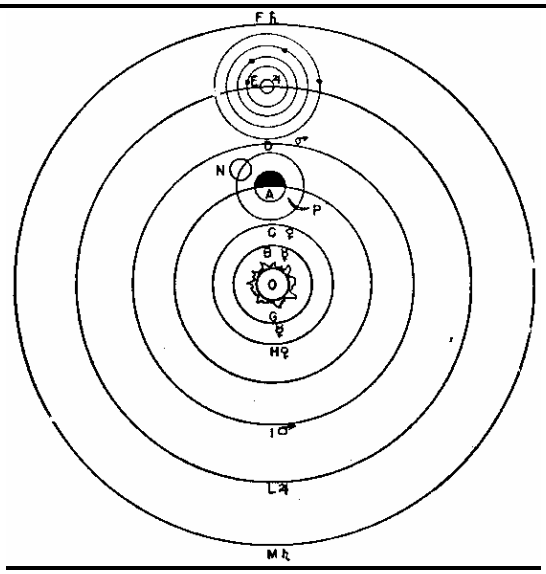
SIMPLICIO: ***Quali poi sono gl'indizii che i movimenti loro sieno intorno al Sole?*** But what are the signs that they move around the sun?

SALVIATI: ***Si argomenta ne i tre pianeti superiori, Marte Giove e Saturno…*** This is reasoned out from finding the three outer planets -- Mars, Jupiter, and Saturn – are always quite close to Earth when they are in opposition to the sun, and very distant when they are in conjunction with it. As to the moon, it is true that this can never separate from Earth in any way, for reasons that will be set forth more specifically as we proceed.

SIMPLICIO: ***Io non resto ancora ben capace di questa struttura.*** I am not yet convinced of this arrangement at all. Perhaps I should understand it better from the drawing of a diagram.

SALVIATI: ***E cosí sia.*** As you wish. But for your greater satisfaction, and your astonishment, too, I want you to draw it yourself. You will see that however firmly you may believe yourself not to understand it, you do so perfectly, and simply by answering my questions you will describe it exactly. First, since you are sure without my telling you that Earth is located in this universe, mark some point at your pleasure where you intend this to be located, and designate it by means of some letter.

SIMPLICIO: ***Sia questo, segnato A, il luogo del globo terrestre.*** Let this be the place of the terrestrial globe, marked A.



I will project this image on the screen.

SALVIATI: ***Bene sta.*** Very well. I know in the second place that you are aware that Earth is not inside the body of the sun, but is distant from it by a certain space. Therefore assign to the sun some other place of your choosing, as far from Earth as you like, and designate that also.

SIMPLICIO: ***Ecco fatto.*** Here I have done it; let this he the sun's position, marked 0.

SALVIATI: ***Stabiliti questi …*** This established, I want you to think about placing Venus in such a way that its position and movement can conform to what sensible experience shows us about it.
SIMPLICIO: ***Posto che sieno vere le apparenze narrate da voi…*** Let's see, Venus never recedes from the sun beyond a certain interval of forty degrees or so. These appearances being correct, I do not see how to escape that Venus revolves in a circle around the sun, in such a way that this circle cannot possibly embrace Earth, nor to be between the sun and Earth, nor be beyond the sun. Therefore I shall draw the circle CH around the sun, without having this include Earth.

SALVIATI: ***Accomodata Venere, è bene che pensiate a Mercurio…*** Venus provided for, it is fitting to consider Mercury.

SIMPLICIO: ***Non è dubbio che, immitando egli Venere…*** There is no doubt that, imitating Venus as it does, the most appropriate place for it will be a smaller circle, within this one of Venus and also described about the sun.

SALVIATI: ***Marte poi dove lo metteremo?*** Next, where shall we put Mars?

SIMPLICIO: ***Marte, perché viene all'opposizion del Sole…*** Mars, since it does come into opposition with the sun, must embrace Earth with its circle. And I see that it must also embrace the sun; for, it comes into conjunction with the sun and the circle must include the sun as well as Earth because it always appears round. Therefore I can account for the observed phenomena by a giving Mars a motion described by a circle around the sun and embracing Earth, which I mark DI.

SAGREDO: ***Giove e Saturno?*** How about Jupiter and Saturn?

SIMPLICIO: ***Giove ed in Saturno, se ben con assai minor diversità in Giove che in Marte…***
Well Jupiter and Saturn have the same appearances as Mars, so it seems clear to me that we can also accommodate these two planets very neatly with two circles around the sun. The first, for Jupiter, I mark EL; the other for Saturn, called FM.

SALVIATI: ***Voi sin qui vi sete portato egregiamente.*** So far Simplicio you have comported yourself uncommonly well.

SALVIATI: ***Ora che faremo, signor Simplicio, delle stelle fisse?*** Now what shall we do, Mr. Simplicio, with the stars? Do we want to sprinkle them throughout the immense abyss of the Universe at various distances, or place them on a spherical surface extending around a center of their own?

SIMPLICIO: ***Piú tosto torrei una strada di mezzo…*** I had rather take a middle course, and assign to them an orb described around a definite center and included between two spherical surfaces, a very distant concave one, and another closer and convex. This might be called the universal sphere, containing within it the spheres of the planets we have already designated.

SALVIATI: ***Adunque già aviamo noi, signor Simplicio…*** Simplicio, you hosehead, what you have been doing all this while is arranging the universe according to Copernicus, and this has been done **by your own hand!** In all these movements you agree with Copernicus himself. See what great simplicity is to be found in this rough sketch, yielding the reasons for so many phenomena in the heavenly bodies.

SAGREDO: ***Io la scorgo benissimo…*** Even though Simplicio stands there with his mouth open, I see this very well indeed. But if this arrangement makes so much sense, why it has found so few followers in the course of centuries; why it has been refuted by Aristotle himself, and why even Copernicus is not having any better luck these days.

SALVIATI: ***Se voi, signor Sagredo, vi foste alcuna volta abbattuto…*** Sagredo, if you had suffered even a few times, as I have so often, from hearing the sort of follies that are designed to make the common people unwilling to listen to this idea (let alone assent to it), then I think your astonishment at finding so few men holding this opinion would dwindle a good deal. It seems to me that we can have little regard for **imbeciles** who take it as a conclusive proof of Earth's motionlessness that Earth is too heavy to climb up over the sun and then fall headlong back down again. There is no need to bother about such men as these, whose number is legion, or to take

notice of their fooleries. Besides, with all the proofs in the world what would you expect to accomplish in the minds of people who are too stupid to recognize their own limitations? No, Sagredo, my surprise is very different from yours. You wonder that there are so few followers of the Copernican opinion, whereas I am astonished that there have been **any** at all who have embraced and followed it. Nor can I ever sufficiently admire those who have taken hold of this opinion and accepted it as true. They have through sheer force of intellect done such violence to their own senses as to prefer what reason told them over that which sensible experience plainly showed them to the contrary. For the arguments against the whirling of Earth are very plausible, and the fact that the Ptolemiacs and Aristotelians and all their disciples took them to be conclusive is indeed a strong argument of their effectiveness. The experiences which overtly contradict the annual movement of Earth are indeed so great in their apparent force that, I repeat, ***there is no limit to my astonishment when I reflect that Copernicus was able to make reason so conquer sense that, in defiance of the latter, the former became mistress of his belief.***

La commedia è finita!